10191/2233

## COMBINED DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

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My residence, post office address and citizenship are as stated below adjacent to my name.

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled **PIEZOCERAMIC ACTUATOR AND METHOD FOR ITS MANUFACTURE**, and the specification of which:

[]	is attached hereto;			
[]	was filed as United States Application Serial No.			
	, 19 and was amended by the Preliminary			
	Amendment filed on, 19			
[x]	was filed as PCT International Application Number			
	PCT/DE00/02527, on the 2nd day of August, 2000.			

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a). I hereby claim foreign priority benefits under Title 35, United States Code § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international applications(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

Express Rail No. EL 2445/09/8 US

PRIOR FOREIGN/PCT APPLICATION(S)
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119

Country: Federal Republic of Germany

Application No.: 199 36 713.2

Date of Filing: 6 August, 1999

Priority Claimed

Under 35 U.S.C. § 119 : [x] Yes [] No

I hereby claim the benefit under Title 35, United States Code § 120 of any United States Application or PCT International Application designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations § 1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR
PCT INTERNATIONAL APPLICATIONS
DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. § 120

## **U.S. APPLICATIONS**

Number:

Filing Date:

PCT APPLICATIONS
DESIGNATING THE U.S.

PCT Number:

PCT Filing Date:

I hereby appoint the following attorney(s) and/or agents to prosecute the above-identified application and transact all business in the Patent and Trademark Office connected therewith.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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receiving the probe head" [See the bore, which begins b upper opening 6 and passes through the analysis area 12 to the lower opening 7], "wherein the probe head includes a support body" (i.e. guide tube 3) "carrying at least one solenoid coil as measuring coil" (i.e. see figures 1 and 2 where the analysis area is defined by the alternating and vertically offset, (i.e. the solenoid) coil windings that are shown to extend at least partially about the sample container 2, and supported upon the exterior of guide tube 3 within the bore, as the means for performing/receiving the NMR analysis signals;) [See also col. 3 lines 58-66, col. 6 lines 11-19] Bartuska also teaches shows and suggests, from figures 1 and 2, "the use of a feed line" (i.e. the shaft/bore from upper opening 6 through the magnetic resonance automatic sample changing spectrometer bore) "towards the solenoid coil" (i.e. the alternating and vertically offset coil, (i.e. the solenoid shaped coil) shown in the figures around guide tube 3, and about sample tube 2, within the analysis region 12)) "via which a sample material" (i.e. sample tube 2 containing the sample to be analyzed) "can be introduced into a measuring volume surrounded by said solenoid coil" (i.e. region 12), "wherein said feed line is configured for receiving and conveying sample containers through said measuring volume". [See figures 1 and 2 in combination.]

15. The **Bartuska** reference, lacks a direct written teaching that the represented coil windings of figures 1 and 2 are explicitly from a solenoid coil, however figure 2 clearly shows that the profiled windings alternate from side-to-side, with a vertical offset that is directly suggestive of solenoid shaped coil windings. Figures 1 and 2 also depict the interior of the device, without showing the intrinsic windings, which must necessarily extend about the front and sides, of the analysis area, in order to clearly show the sample tube clearly illustrated as it passes through the analysis measurement volume12. It would have been obvious to one of ordinary skill in the art at the time that the invention was made, that the coil windings shown in figures 1 and 2 are of a solenoid type, on the exterior of the guide tube 3 and surround the analysis area 12 through which sample tube 2, necessarily passes, because of the illustrations of figures 1 and 2 provided, represent an interior view.]

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16. With respect to **Claim 18**, **Bartuska** teaches that "said feed line is configured for receiving a plurality of sample containers disposed in succession." [See col. 9 lines 43-65.] The same reasons for rejection, and obviousness, that apply to **claim 15** also apply to **claim 18** and need not be reiterated.

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- 17. With respect to **Claim 19**, **Bartuska** teaches and shows that "said feed line is connected to a conveying mechanism" (i.e. motion of storage rack 4 indicated by the arrow in figures 1 and 2; the vertical drop; gravity; optical sensor 20; and the retraction or support of components 13a and 13b) "permits stepwise conveyance of said sample containers" (i.e. sample containers 2) "in said feed line". [See figures 1 and 2 in combination, the abstract, and col. 1 line 7 through col. 10 line 57 in general as this limitation is explained as a detailed series of steps throughout the reference.] The same reasons for rejection, and obviousness, that apply to **claim 15** also apply to **claim 19** and need not be reiterated.
- 18. With respect to **Claim 20**, **Bartuska** teaches and shows that "said conveying mechanism" (i.e. motion of storage rack 4 indicated by the arrow in figures 1 and 2; the vertical drop; gravity; optical sensor 20; and the retraction or support of components 13a and 13b) "provides said conveyance by pressing a propelling agent" (i.e. air and the displacement of air via the use of the sample tube being vertically displaced by falling through gravity) "into said feed line". [See figures 1 and 2 in combination, the abstract, and col. 1 line 7 through col. 10 line 57 as how the **Bartuska** device functions to use air and gravity in a novel manner for changing magnetic resonance samples automatically is explained as a detailed series of steps throughout the reference.] The same reasons for rejection, and obviousness, that apply to **claim 15** also apply to **claim 20** and need not be reiterated.
- 19. With respect to **Claim 21**, **Bartuska** shows that "said sample containers" (i.e. component 2) "are constructed and arranged for complete introduction into said measuring volume" [See figures 1 and 2 in combination.] The same reasons for rejection, and obviousness, that apply to **claim 15** also apply to **claim 21** and need not be reiterated.

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20. With respect to Claim 22, Bartuska lacks an exact verbatim teaching that the "said sample containers are constructed and arranged for receiving a maximum sample volume of =< 1 ml.", because the **Bartuska** reference is silent as to the size of the sample volume of each of the sample tubes 2, as well as silent to the size of the analysis zone 12, and the size of the sample tube itself. However, conventionally NMR spectrometer devices are known to be used to analyze samples having a volume from within the nano / pico (i.e.  $10^{-9}$ ,  $10^{-12}$ ) liter range, through the range of multiple cm<sup>3</sup>, depending upon the situation and the MR application desired. Additionally, because the use of micro, nano, or pico liter size sample tubes, or the use of 1mL., or 5 cm<sup>3</sup> sample tubes is a design choice, it would have been obvious to one of ordinary skill in the art at the time that the invention was made that to have "said sample containers constructed and arranged for receiving a maximum sample volume of =< 1 ml.", in those MR spectroscopic application situations where the desired sample size is not greater than 1ml to start with, because the ability to examine samples > 1 ml., would not be necessary, and including an unnecessary size sample volume would not be cost effective. Therefore, It would have been obvious to one of ordinary skill in the art at the time that the invention was made that Bartuska the reference has no specific size of the sample volume set forth, that any desirable maximum sample volume, may be utilized within the scope of the Bartuska reference. The same reasons for rejection, and obviousness, that apply to claim 15 also apply to claim 22 and need not be reiterated.

- 21. With respect to Claim 23, Bartuska shows that "said feed line is passed from a receiving opening of said probe head for said sample containers through said measuring volume to a discharge opening of said probe head for said sample containers." [See figures 1 and 2 in combination.] The same reasons for rejection, and obviousness, that apply to claim 15 also apply to claim 23 and need not be reiterated.
- 22. With respect to **Claim 24**, **Bartuska** shows that "said feed line is of a tubular configuration. [See figures 1 and 2 in combination.] The same reasons for rejection, and obviousness, that apply to **claim 15** also apply to **claim 24** and need not be reiterated.

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23. With respect to Claim 26, Bartuska teaches and shows a "Method of operating the probe head according to any one of claims 15-25, comprising charging the sample material into a sample container, introducing said sample container into said feed line and conveying in said feed line in a conveying direction to said measuring volume, and, after measurement, conveying via said feed line along the conveying direction said sample container out of said measuring volume." [See figures 1 and 2 in combination, the abstract, and col. 1 line 7 through col. 10 line 57 as the methodology of how the Bartuska device functions to insert and remove magnetic resonance samples in a novel manner automatically is explained as a detailed series of steps throughout the reference.] The same reasons for rejection, and obviousness, that apply to claims 15, 18, 19, 20, 21, 23, and 24 also apply to claim 26 and need not be reiterated.

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- 24. With respect to Claim 27, Bartuska teaches and shows that "said sample container" (i.e. component 2) "is conveyed by a propelling agent" (i.e. air and the displacement of air via the use of the sample tube being vertically displaced by falling through gravity) "in said feed line". [See figures 1 and 2 in combination, the abstract, and col. 1 line 7 through col. 10 line 57 as how the Bartuska device functions to use air and gravity in a novel manner for changing magnetic resonance samples automatically is explained as a detailed series of steps throughout the reference.] The same reasons for rejection, and obviousness, that apply to claims 15, 18, 19, 20, 21, 23, 24 and 26 also apply to claim 27 and need not be reiterated.
- 25. With respect to Claim 27, Bartuska teaches and shows that "a plurality of said sample containers containing same or different sample materials are introduced in succession into said feed line and are subsequently conveyed together in steps in said feed line for measuring each in succession." [See col. 1 lines 3-28; col. 9 lines 43-65, figures 1 and 2 in combination, and the entire reference in general.] The same reasons for rejection, and obviousness, that apply to claims 15, 18, 19, 20, 21, 23, 24 and 26 also apply to claim 28 and need not be reiterated.
- 26. Claims 16, 17, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartuska US patent 5,146,166 issued September 8<sup>th</sup> 1992; as

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applied to claims 15, 18-21, 23, 24, and 26-28 above, and further in view of Gilderdale et al., US patent 5,876,338 issued March 2<sup>nd</sup> 1999.

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With respect to Claim 16, Bartuska lacks directly teaching or showing that the 27. "at least one solenoid coil" (i.e. of analysis section 12) "is detachably connected to said support body" (i.e. component 3). Because Bartuska is silent as to whether or not the coil is detachable or fixed. The examiner interprets the Bartuska reference as including within its scope either a fixed or a detachable coil. Additionally Gilderdale et al., teaches and shows that the limitation of having "at least one solenoid coil" being "detachably connected to said support body" of a probe head in a magnetic resonance device, is a limitation that is already established for magnetic resonance compatible probes, which perform measurements on one or more, same or different samples, because it enhances probe utility and reduces replacement costs. [See the Gilderdale et al., abstract, figures 1-4 and col. 1 line 5 through col. 5 line 40; where Gilderdale et al., teaches and shows an MR compatible endoscope has an associated MR saddle coil 10 mounted on a removable former 9, and that the tip 2 of the MR compatible endoscope (i.e. a portable MR probe head) which has the usual service channels for imaging enabling easy repair and the use of a range of coils in order to accommodate different magnetic field strengths.] It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify Bartuska reference which shows solenoid coil about an exterior support body guide tube 3, with the "replaceable coil" teaching of Gilderdale et al., in order to simplify the replacement of the measuring coil within analysis area 12, when necessary and reduce replacement costs, since only the coil would need to be replaced if it became damaged, as opposed to the entire automatically sample changing spectrometer. The same reasons for rejection, and obviousness, that apply to claim 15 also apply to claim 16 and need not be reiterated.

28. With respect to Claim 17, Bartuska lacks directly teaching or showing that the "support body" (i.e. Bartuska guide tube 3) "and said at least one solenoid coil" (i.e. the coil of Bartuska analysis section 12) "are detachably connected by a plug-and-socket connector. However, Gilderdale et al., teaches and shows that the limitation of having the "support body" (i.e. Gilderdale et al., former 9) "and said at least one solenoid coil"

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(i.e. the MR saddle coil 10 of Gilderdale et al.,) "detachably connected by a plug-andsocket", is an established limitation, that is known but is not needed in the Gilderdale et al., invention. [See Gilderdale et al., col. 1 line 65 through col. 2 line 3, and the Gilderdale et al., abstract.]The examiner notes that the ability to 'avoid the need' for plugs and sockets, implies and is a direct suggestion by Gilderdale et al., that the coupling of a removable coil to the endoscopic MR compatible probe device, via plugs and sockets, is already established and recognized a common feature within the art. The Gilderdale et al., invention improves upon established and known plug and socket connectors in MR probe devices by using an inductive coupling of the removable coil, instead of the known plug and socket technique. [See Gilderdale et al., col. 1 line 65 through col. 2 line 3.] It would have been obvious to one of ordinary skill in the art at the time that the invention was made that the coil of Bartuska, which may be either fixed or detachable for the reasons noted in the rejection of claim 16 above, could also be removed and exchanged with another coil, as noted in the Gilderdale et al., abstract and reference, "via a plug-and-socket" connection, because the use of an exchangeable "plug-and-socket" is already known as a means by which different coils can be activated by the same power source. The same reasons for rejection, and obviousness, that apply to claims 15, 16 as well as the motivation to combine that applies to claim 16 also apply to claim 17 and need not be reiterated.

29. With respect to Claim 25, Bartuska lacks directly teaching or showing "a plurality of solenoid coils of different size which are connected to said support body in alternation." However, Gilderdale et al., teaches and shows that the limitation of having "a plurality of solenoid coils of different size which are connected to said support body" (i.e. the coil former 9) "in alternation" [See the Gilderdale et al., abstract, col. 1 line 48-64; col. 2 lines 52-59; col. 3 lines 51-60; col. 4 lines 16-28; col. 5 lines 36-41], is a known limitation enabling a range of coils, to be fitted to MR probe structure, in order to easily accommodate different magnetic field strengths. [See the Gilderdale et al., abstract.] Because the Bartuska reference analyzes a significant number of 'similar' (i.e. either the same / identical, or different / not identical), samples consecutively, and has each sample tube enter the analysis area individually, [See Bartuska col. 1 lines 3-28], it

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would have been obvious to one of ordinary skill in the art at the time that the invention was made that the ability to interchange / exchange the coil of the analysis area 12 with one of "a plurality of solenoid coils of different size which are connected to said support body" (i.e. guide tube 3), as in the portable endoscopic MR probe device of **Gilderdale et al.**, would enable the **Bartuska** sample changing MR probing spectrometer to be used on the same plurality of samples at different field strengths, without requiring a whole series of separate MR sample changing spectrometer device to be constructed, for each magnetic field strength for which an analysis is desirable, increasing both the utility, and versatility of the **Bartuska** invention. The same reasons for rejection, and obviousness, that apply to **claims 15, 16,** as well as the motivation to combine that applies to **claim 16** also applies to **claim 25** and need not be reiterated.

## Conclusion

- 30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.
- 31. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is (571) 273-8300.
- 32. Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system Status information for published applications may be obtained from either Private PMR or Public PMR. Status information for unpublished applications is available through Private PMR only. For more information about the PMR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PMR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TAF
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